

where  $X, X_1, X_2, X_3$  and  $X_4$  are from one to about three atoms, are the same or different and are independently selected from the group consisting of hydrogen, an alkyl group, an alkenyl group, a heteroalkyl group and a heteroalkenyl group,

and any carbons or nitrogens of said alkyl group, alkenyl group, heteroalkyl group or heteroalkenyl group can optionally be substituted with a straight, branched or cyclic lower alkyl group of from 1 to about 6 carbons;

$Z$  is selected from the group consisting of C, CH,  $CH_2$ , N, NH, S, O,  $CH=CH$ ,  $CH=N$  and  $N=CH$ ;

$L$  is selected from the group consisting of C, CH,  $CH_2$ , N, NH, S, O,  $CH=CH$ ,  $CH=N$  and  $N=CH$ , but when  $Z$  is C, CH,  $CH=CH$  or  $CH_2$  then  $L$  is N, NH, S or O;

$M$  is selected from the group consisting of carbon and CH;

the chemical bond between  $L$  and  $M$  is selected from the group consisting of a single bond and a double bond, and  $M$  is carbon when the bond is a double bond, and  $M$  is CH when the bond is a single bond;

the chemical bond between  $M$  and  $Z$  is selected from the group consisting of a single bond and a double bond, and  $M$  is carbon when the bond is a double bond, and  $M$  is CH when the bond is a single bond;

but when the bond between  $L$  and  $M$  is a double bond the bond between  $M$  and  $Z$  is a single bond;

at least one of  $R_2$ ,  $R_3$ ,  $R_4$ , or  $R_5$  is present;

$R_1$ ,  $R_4$  and  $R_5$  are the same or different and are selected from the group consisting of hydrogen, an alicyclic group, a heterocyclic group, an aryl group, a heteroaryl group, an alkylaryl group, a alkylheteroaryl group, a substituted aryl group, a substituted heteroaryl group, a substituted alkylaryl group and a substituted alkylheteroaryl group;

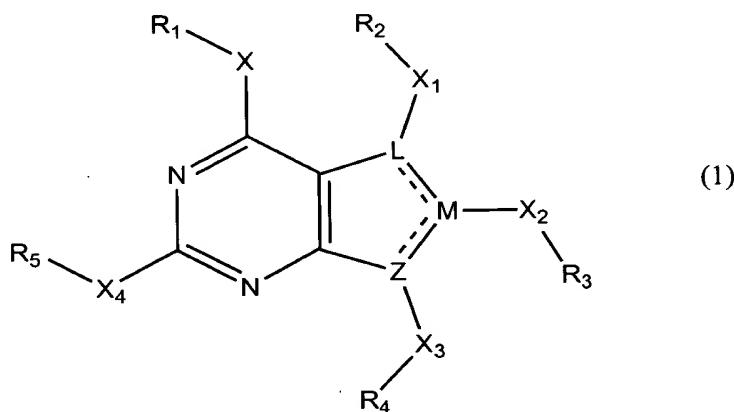
$R_2$  and  $R_4$  are optional, are the same or different and are selected from the group consisting of hydrogen, an alicyclic group, a heterocyclic group, an aryl group, a heteroaryl group, an alkylaryl group, a alkylheteroaryl group, a substituted aryl group, a substituted heteroaryl group, a substituted alkylaryl group, a substituted alkylheteroaryl group, and *p*-aroyle-glutamate;

and each substituent of any substituted group is the same or different and is selected from the group consisting of a straight, branched or cyclic lower alkyl, alkenyl or

*a1* alkynl group of from one to about 6 carbons, an alkoxy group, an alkoxyaryloxy group, and a halogen.

**Page 7, first paragraph under "DETAILED DESCRIPTION OF THE INVENTION", which wraps through page 8, line 23.**

*a2* The present invention is directed to compounds, and pharmaceutically acceptable salts, solvates, and prodrugs thereof, having formula (1):



where X, X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub> and X<sub>4</sub> are from one to about three atoms, are the same or different and are independently selected from the group consisting of hydrogen, an alkyl group, an alkenyl group, a heteroalkyl group and a heteroalkenyl group,

and any carbons or nitrogens of said alkyl group, alkenyl group, heteroalkyl group or heteroalkenyl group can optionally be substituted with a straight, branched or cyclic lower alkyl group of from 1 to about 6 carbons;

Z is selected from the group consisting of C, CH, CH<sub>2</sub>, N, NH, S, O, CH=CH, CH=N and N=CH;

L is selected from the group consisting of C, CH, CH<sub>2</sub>, N, NH, S, O, CH=CH, CH=N and N=CH, but when Z is C, CH, CH=CH or CH<sub>2</sub> then L is N, NH, S or O;

M is selected from the group consisting of carbon and CH;

the chemical bond between L and M is selected from the group consisting of a single bond and a double bond, and M is carbon when the bond is a double bond, and M is CH when the bond is a single bond;

the chemical bond between M and Z is selected from the group consisting of a single bond and a double bond, and M is carbon when the bond is a double bond, and M is CH when the bond is a single bond;

but when the bond between L and M is a double bond the bond between M

*a*  
and Z is a single bond;

at least one of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, or R<sub>5</sub> is present;

R<sub>1</sub>, R<sub>4</sub> and R<sub>5</sub> are the same or different and are selected from the group consisting of hydrogen, an alicyclic group, a heterocyclic group, an aryl group, a heteroaryl group, an alkylaryl group, a alkylheteroaryl group, a substituted aryl group, a substituted heteroaryl group, a substituted alkylaryl group and a substituted alkylheteroaryl group;

R<sub>2</sub> and R<sub>3</sub> are the same or different and are selected from the group consisting of hydrogen, an alicyclic group, a heterocyclic group, an aryl group, a heteroaryl group, an alkylaryl group, a alkylheteroaryl group, a substituted aryl group, a substituted heteroaryl group, a substituted alkylaryl group, a substituted alkylheteroaryl group, and *p*-aroyl-glutamate;

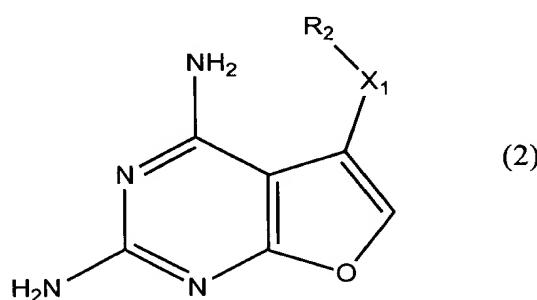
and each substituent of any substituted group is the same or different and is selected from the group consisting of a straight, branched or cyclic lower alkyl, alkenyl or alkynl group of from one to about 6 carbons, an alkoxy group, an alkoxyaryloxy group, and a halogen.

**Page 9, last paragraph which wraps to page 10:**

*a*  
<sup>3</sup>  
Also included within the scope of the present invention are alicyclic groups, as that term is understood in the art, and heterocyclic groups. As used herein, the term "heterocyclic group" will refer to non-aromatic cyclic substituents in which one or more members of the ring is not carbon, for example oxygen, sulfur or nitrogen.

**Page 11, line 20, wrapping through to page 13, line 14**

*a*  
<sup>4</sup>  
In preferred embodiments, compounds of the present invention will have the general formula (2):



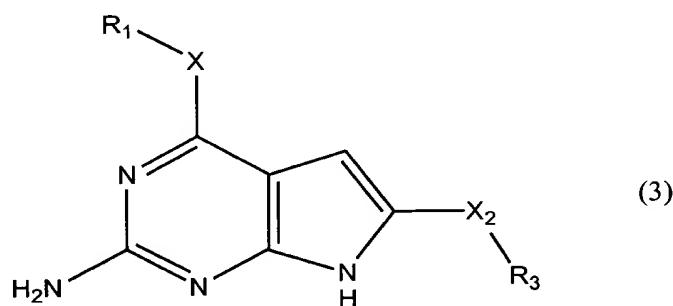
$R_6$ 

where  $X_1$  is  $CH=C$ , and  $R_6$  is selected from the group consisting of hydrogen and a straight, branched or cyclic lower alkyl group of from 1 to about 6 carbons;

*A4*  
 $R_2$  is selected from the group consisting of hydrogen, an alicyclic group, a heterocyclic group, an aryl group, a heteroaryl group, an alkylaryl group, a alkylheteroaryl group, a substituted aryl group, a substituted heteroaryl group, a substituted alkylaryl group, a substituted alkylheteroaryl group, and *p*-acetyl-glutamate;

and each substituent of any substituted group is the same or different and is selected from the group consisting of a straight, branched or cyclic lower alkyl, alkenyl or alkynyl group of from one to about 6 carbons, an alkoxy group, an alkoxyaryloxy group, and a halogen.

In additional preferred embodiments, compounds of the present invention will be represented as having the general formula (3):



where  $X$  and  $X_2$  are from one to about three atoms, are the same or different and are independently selected from the group consisting of hydrogen, an alkyl group, an alkenyl group, a heteroalkyl group and a heteroalkenyl group,

and any carbons or nitrogens of said alkyl group, alkenyl group, heteroalkyl group or heteroalkenyl group can optionally be substituted with a straight, branched or cyclic lower alkyl group of from 1 to about 6 carbons;

at least one of  $R_1$  or  $R_3$  are present;

$R_1$  is selected from the group consisting of hydrogen, an alicyclic group, a heterocyclic group, an aryl group, a heteroaryl group, an alkylaryl group, a alkylheteroaryl group, a substituted aryl group, a substituted heteroaryl group, a substituted alkylaryl group and a substituted alkylheteroaryl group;

$R_3$  is selected from the group consisting of hydrogen, an alicyclic group, a heterocyclic group, an aryl group, a heteroaryl group, an alkylaryl group, a alkylheteroaryl